BIKKENSTOCK MBH

Drucklufttechnik • D - 33442 Herzebrock - Clarholz

OPERATING MANUAL FOR ELECTRIC COMPRESSORS

CONSTRUCTION SAMPLE Ps x V BETWEEN 200 and 1000 STATIONARY DESIGN OR MOBILE COMPRESSOR BRIDGE MOUNTED ON CONTAINER

CE 0091

1.1 Please note before commissioning

Before commissioning the compressor, this operating manual must be read carefully and observed.
With any damage and operational malfunctions caused by improper handling, non-observance and non-compliance with this operating manual, no guarantee or warranty will be accepted.

This electric compressor is a series-produced piece of pressure equipment within the meaning of Art. 1 of the
Directive 2014/68/EU or Art.1 of Directive 2014/29/EU. In accordance with Annex 2, Number 7.25 - Special testing requirements for certain pressure systems and system components - of the Ordinance on Industrial Safety and Health (BetrSichV), a test can be carried out on a sample by an approved inspection body before commissioning without reference to an installation site for systems manufactured in series, provided that for devices or containers the product of the maximum permissible pressure Ps and the relevant volume V does not exceed 1000 bar litres. This testing prior to initial commissioning has already been carried out at the manufacturing plant by a TÜV expert.

For this electric compressor, the manufacturer has already carried out a risk assessment in the sense of § 3 BetrSichV (Ordinance on Industrial Safety and Health) at the manufacturing plant.

For this electric compressor, the manufacturer has already carried out a risk assessment in the sense of § 3 BetrSichV (Ordinance on Industrial Safety and Health) at the manufacturing plant.

1.3 Note for the operating company

For this electric compressor, the manufacturer has already carried out a hazard analysis and a risk assessment in accordance with the Pressure Equipment Directive 2014/68 /EU at the manufacturing plant.

2.0 Technical data

Notes for the operating company:

To identify your electric compressor, you will find all the relevant technical data on the type plate, representative and as an example you will find the following data:

Compressor type	K 18 500 /90 /400
Max. volume flow	500 L / min
Max. delivery rate	350 L / min
Motor power	(400 V) 3 KW
Allowable compressor discharge pressure	10 bar
Max. compressor speed	1,200 rpm
Number of cylinders	2
Container size	90 litres
CE - marking	CE - 0091
Device - No.	_____
Year of manufacture	_____

2.1 Direction of rotation of the compressor

Compressors with 1-phase AC motor (230 V) rotate automatically in the right direction. These compressors must not be operated with an additional mains extension cable or cable drum.

For compressors with three-phase motors (400 V), make sure that the direction of rotation is correct (as indicated by the red arrow on the V-belt guard).

If the compressor rotates in the wrong direction, 2 phases must be swapped against each other.

⚠ **CAUTION!** this work may only be carried out by a qualified electrician.

3.0 Type testing! Please note: No external interventions!

The design of the electric compressor has been tested. This electric compressor must not be tampered with or technically changed in any way. Modifications and/or additions to the design may only be made with the consent of the manufacturer; in the event of non-compliance, the warranty, guarantee and general operating permit shall immediately become null and void.

⚠ **Important! Please note in particular!**

The electric compressor is equipped with an overpressure safety valve.
This valve has an important safety function against exceeding the maximum permissible operating overpressure and is sealed by the manufacturer.
No changes and/or adjustments may be made to this valve. In the event of a defect, the overpressure safety valve must only be replaced with a new part.
Breaking the seal of the safety valve immediately voids the operating permit!

The automatic operation of the electric compressor is achieved by an electro-pneumatic pressure switch.
The ON and OFF switching points are optimally pre-set at the factory.

For electric compressors in 1-phase AC version / 230 V, the max. switch-on pressure must not exceed 5 bar.

⚠ **Please note! Important note!**

Modifications to the ON or OFF switching points may only be made by a qualified electrician when the container is under pressure.
In the event of a defect, the pressure switch must only be replaced with a new part.

If the ON or OFF switching points should become misaligned, they must be readjusted, otherwise the fatigue strength of the compressed air reservoir cannot be ensured.
Please observe the setting instructions of the container manufacturer.
You will find the information in the operating manual of the compressed air reservoir.
The operating manual belonging to each device are enclosed as an appendix.

4.1 Electrical connection

⚠ **Important note!**

Before connecting the compressor to the mains, make sure that the type of current and voltage indicated on the type plate corresponds to the type of current and voltage of your mains.
Observe the regulations of your electricity company.

Electric compressors in 1-phase AC version (230 Volt/ 50 Hz) must be fused as follows:

1.5 KW – motor >>>	16 Amp.	Sluggish
2.2 KW – motor >>>	16 Amp.	Sluggish

If the AC motor is overloaded, the thermal motor protection switch on the motor trips.
When this occurs, turn the CONDOR pressure switch to the / **zero** position,
empty the compressed air reservoir **to 0 bar**.

Only then restart the motor protection switch.

Electric compressors in 3-phase version (400 V /50 Hz) up to 4 KW drive power are delivered ready for connection with mains plug.

Electric compressors with a drive power greater than 4 KW are controlled by star-delta circuits and are put into operation via the
ON-OFF switch fitted here.

⚠ **CAUTION!** The assembly of the star-delta circuit may only be carried out by a qualified electrician.

4.2 Set-up

The electric compressor must be easily accessible from all sides; the minimum distance to the nearest wall must be at least 60 cm.

⚠ **Important note!**

The **OFF switch button** must be accessible at all times and without obstacles!

The set-up room must be at least 27 m ^{3} and must comply with the relevant regulations of the local building authorities or the local fire brigade.

Important note!

Both the compressor and the electric motor are cooled by cooling air.

It is essential to ensure that sufficient FEED and EXHAUST air can flow through the set-up room.
As a guide value, approx. 20 m^3/min of air can be assumed. This value also includes the intake capacity of the compressor.

The set-up site must be free of dust and paint mist, as well as other hazardous substances, whether solid, liquid or gaseous. The set-up room must comply with the regulations of the local building authority.

Note!

The required load-bearing capacity of the substrate should be at least 250 kg/m2. The set-up surface should be horizontal.

Caution! Strictly observe!

Do not store flammable substances near the compressor. Do not operate the compressor in the blazing sun or rain. Never set up or operate the unit near a heating system!

Make absolutely sure that no hazardous air admixtures are sucked in by the intake filter (hazardous air admixtures are e.g. solvent vapours, dusts and other harmful substances).

Open flames, welding work and flying sparks (e.g. with angle grinder) are to be strictly avoided in the vicinity of the compressor.

In accordance with Directive 2000 /14 EC (Noise Emissions Directive), the electric compressor has been subjected to a conformity assessment procedure by the manufacturer.
According to EN ISO 3744 : 1995 and EN ISO 3746 : 1995 the noise emissions are:

Measured sound power level:	85 dB (A)
Guaranteed sound power level:	89 dB (A)

The noise level LpA was measured: the measurement was in conformity with the

standard. Stationary electric compressors must not be connected to the compressed air network with fixed piping. To avoid vibration transmission between the electric compressor and the compressed air pipe network (or between the electric compressor and the system), a flexible industrial hose in accordance with EN 854 2 TE; DIN 20021 with an inside diameter of at least 12 mm, a hose length of at least 600 mm, approved for a working pressure of at least 40 bar, must be fitted.

5.1 Operation

5.2 Commissioning - Switching on the compressor for the first time

Before commissioning, please note that the type of current, the frequency and the voltage of your mains supply correspond to the specifications on the type plate of the electric motor or on the type plate of the compressor.

Once the set-up site of the compressor has been made safe, it can be switched on.
To do this, connect the compressor to the mains and the compressed air hose to the air extraction point.
Check the oil level on the compressor oil sight glass. The oil level must not drop below the centre of the oil sight glass.

Electric compressors with a drive power of up to 4 KW are switched ON or OFF directly by pressing the push button on the pressure switch.

The electric compressor must be on a level and safe standing surface before it is switched on.

⚠ **Please note!**

After you have started up your electric compressor, it continues in operation automatically. As soon as the factory-set switch-off point is reached, the compressor switches off automatically.

5.3 Winter operation

The cold season can cause the compressor oil in the crankcase to become viscous. This gives the compressor a more difficult start-up phase. It is therefore recommended to operate the compressor in a well-ventilated room at an ambient temperature of at least + 5 0 C.

5.4 Operating time - Switch-on time of the compressors

Electric compressors of this range and design have a switch-on time of up to 60 %.

6.1 NOTES FOR THE OPERATING PERSONNEL

Compressed air is a form of energy; therefore, electric compressors and handling with compressed air equipment may only be operated by instructed persons who

- have reached the age of 18
- have the required expertise with regard to equipment and procedures and can be expected to reliably fulfil their task.

Persons who are over 16 years of age may also operate electric compressors if this is

- required to achieve their training objective and
- they are supervised by an adult, who has the necessary expertise.

7.1 MAINTENANCE, INSPECTION AND CARE

7.2 Draining the condensation water

Condensation water forms in the pressure vessel during operation,
The condensation water must be drained off at regular intervals (see table) by slightly turning (2 - 3 turns are sufficient) the drain screw connection at the bottom of the container and
disposed of properly.

As an optional extra, you can also have an automatic condensation water drain valve installed or have an oil-water separation system fitted; please ask your specialist dealer about this.

7.2 Oil change

The first oil change should be carried out after a maximum of 100
Only compressor lubricating oil with viscosity class
100 e.g. VDL 100 according to DIN 51506 can be used.
The compressor oil must not be mixed with HD or SAE oils; damage to the compressor may result.

The amount of compressor oil depends on the size of the compressor; the table below indicates the amount of oil required for your compressor:

Compressor type	Required oil quantity in litres
K 8	0.40
K 11	0.50
K 17	1.00
K 18	1.00
K 24	1.80
K 28	1.80
K 30	1.45
K 35	1.45
K 50	1.75
K 60	3.00
K 100	4.00

⚠ **Caution! Strictly observe!**

The compressor oil must be disposed of properly; ask your specialist dealer. Never dispose of the oil in the water drainage system or in the environment!
Improper disposal is punished severely!

7.3 Air - Intake filter

The air intake filter contains an air filter insert. This must be cleaned regularly with compressed air blowing from the inside to the outside.
The air filters should be cleaned monthly (see table) and the air filter set should be changed 1 to 2 times a year, depending on the degree of contamination of the environment.

7.4 Check: Retighten all screws

It is recommended to retighten all screws and screw connections after the first 5 hours of operation.

7.5 Further testing recommended by the manufacturer

The following testing is recommended 2 times a year:

a) Visual inspections
- Check the entire compressor for oil loss
- Check pressure lines and all screw connections for tightness
- Check the protective device (belt guard)
- Check the structural stability of the electric compressor
- Check electrical cables for worn and damaged parts
- Check the external integrity of the pressure vessel

b) Functional tests
- Check that the pressure gauge is intact and shows the tank pressure
- Check the function of the pressure relief valve by priming it

7.6 Summary of maintenance, checks and care work, transport and subsequent disposal

	Every week	Every month	Every 500	At least 1 x yearly
Condensation drain	X			
Oil check (oil level and condition)		X		
V-belt tension (Condition)			X	
Air filter check (If applicable Air filter		X		
Pressure setting (Check)			X	
Total cleaning				X
Oil change (at least 1 x per year)				X
Electrical connection check				X

The electric compressor is not suitable to be lifted with hoists because suitable eyelets are not provided.

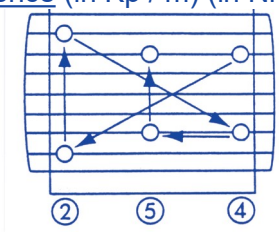
The subsequent disposal of the electric compressor is in accordance with the applicable environmental regulations.

At the end of the service life of the electric compressor, all reusable components should be dismantled and sent for proper recycling in accordance with the applicable legal regulations.

7.7 Retightening the cylinder head bolts

After the electric compressor has been put into operation at the set-up site for the first time, the cylinder head bolts should be retightened. The cylinder head bolts should be retightened when the compressor is at operating temperature in the order shown in the illustration below and with the following tightening torques of the cylinder head bolts:

Compressor type	Tightening torque (in Kp / m)	Tightening torque sequence (in Nm)
K 8	1.7	16.7
K 11 / K 17 / K 18 / K 24	2.9	28.4
K 28 / K 30 / K 35	4.5	44.1
K 50	8.0	78.5
K 60	4.5	44.1
K 100	8.0	78.5



8.0 BEHAVIOUR WITH ANY OPERATIONAL MALFUNCTIONS

Caution! Observe safety instructions!

Before carrying out maintenance and repair work on the compressor, it is essential to disconnect the mains plug and release the compressed air from the pressure vessel.

Only a recognised and approved electrician may carry out work on electrical components.

Never detach any components from the compressor when the pressure vessel is still pressurised. - Risk of injury -

If the compressor has shut down operation via the motor protection switch in the event of a malfunction, the compressed air must be completely released from the pressure vessel before restarting to ensure an easy restart.

9.0 DECOMMISSIONING

The compressor can be switched off at any time, even during operation, by pressing the switch-off button.

Important note!

Never take the compressor out of operation by pulling out the mains plug!

The compressor may only be switched off at the switch-off button!

10.1 SPARE PARTS

If you need spare parts, please specify when ordering:

- Compressor type
- Year of manufacture
- Type of compressor mounted
- Spare part number and designation of the desired spare part

If you have any other questions
Please contact your specialist dealer.

Your specialist dealer